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ABSTRACT

An evaluation identified the separate effects that the Massachusetts Department of Public Welfare's Employment and Training Choices Program (ET) and the healthy Massachusetts private economy have had on welfare caseloads. The analysis was limited to the Aid to Families with Dependent Children (AFDC) portion of the ET program. Regression equations were developed that explained the welfare caseload as a function of the employment level in the state's economy and as a function of ET program activity. Findings were that ET is successful because it removes barriers to labor market participation; both ET and the economy contributed to the sizable decline of the AFDC caseload; ET could never have achieved its level of success without the concurrent economic success; despite the role of the economy, it is still easier for state government to reduce the caseload by increasing ET participation than by raising the employment rate; trade, service, and finance, insurance, and real estate employment had a greater impact on the caseload than did employment in other sectors; and ET will have saved taxpayers at least \$150 million through the end of fiscal year 1988. (An appendix describes in detail the regression equations and how they were developed.) (YLB)

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Training People to Live Without Welfare

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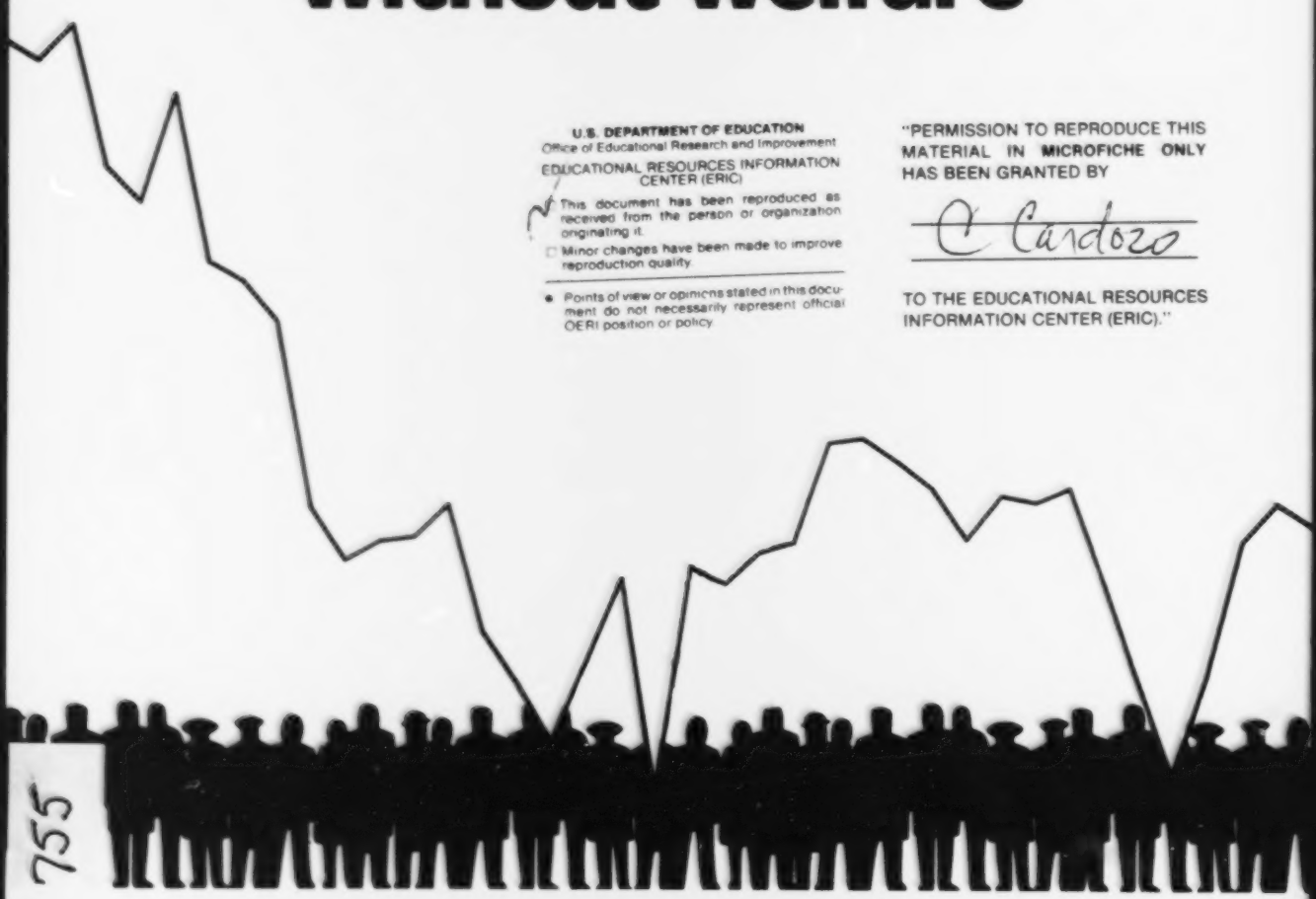
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A booming Massachusetts economy and the Employment and Training Choices Program combine to save taxpayers millions.

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Table of Contents

Executive Summary	i
Introduction	1
Background	1
Methodology	4
Limitations to the MTF Approach	9
Conclusions	11
Appendix	13

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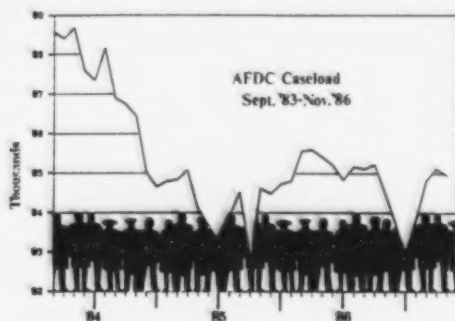
Executive Summary

Does ET really work?

Decline in caseloads due to several factors -- ET program a significant contributor -- 64 percent as effective as job-creation.

On October 1, 1983, the Massachusetts Department of Public Welfare began operating the Employment and Training Choices Program. The goal was to help people on welfare¹ become self-sufficient.

The department has said that without ET, the AFDC caseload would be considerably higher than it is -- that is, that ET is effective in getting or keeping people off welfare.



Is the claim valid? A huge drop in caseloads followed enactment of the federal Omnibus Budget Reconciliation Act of 1981 (OBRA). The decline has continued since ET was begun. Is ET the reason, is it the healthy Massachusetts economy, or a combination of the two?

The MTF analysis was designed to single out the impacts of ET and the state economy from among the various forces that raise and lower AFDC caseloads.

We found that ET has contributed significantly to the drop in the welfare caseload in Massachusetts. For example, it would take the addition of 7,575 new jobs to the state economy to take 100 families off the welfare rolls; the same thing can be accomplished by placing 100 people in jobs through the ET program. (We estimate that 60 percent of those who participate leave the welfare rolls altogether -- see Savings to taxpayers, p. 8.)

¹ Defined here as those receiving or applying for Aid to Families with Dependent Children (AFDC).



7,575
New
Jobs



100 ET
Place-
ments



100 Fewer
AFDC
Cases

It's hard to compare figures of such different magnitudes, so we used the "standard coefficients" method to convert these two factors to the same statistical scale. We find that ET is about 64 percent as effective in cutting the caseload as is creating jobs in the private economy.

Targeting job creation?

Finance sector most effective in cutting AFDC -- about four times as effective as ET

In order to refine our comparison of the effects of ET and employment, we looked at what happens to the caseload when employment opportunities change in three industrial sectors -- service, trade (wholesale and retail) and finance (including insurance and real estate).

We found that ET is about 45 percent as effective as adding jobs in the service sector -- roughly 1,900 service sector jobs will reduce the welfare caseload by 100, as compared with 7,575 jobs of all kinds.

To get the same effect by targeting retail and wholesale trade, about 2,500 trade jobs would have to be added to the economy.

ET vs. Job Creation:



100 ET
Placements



7,575
Jobs



2,500
Trade Jobs



1,900
Service Jobs



442
Fin/Ins/RE Jobs



100
Fewer Cases

However, in finance, insurance and real estate, the addition of 442 new jobs would do as well. Job creation in this sector is almost 4 times as effective as ET in cutting AFDC rolls.

Clearly, if the state were to try to cut welfare cases by creating new jobs, it should tailor its effort to the finance, insurance and real estate sector.

Train workers or create new jobs?

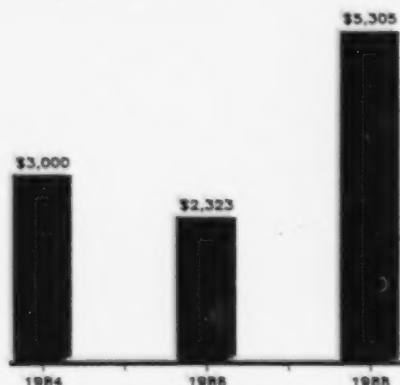
**Cost per placement is rising --
newer candidates are harder to employ,
need more services**

Which is more efficient for government, creating jobs or running an ET program? Hard to say. For one thing, the cost of the program is rising. In its first full year, the average placement cost was \$1,794. In the governor's recommended 1988 budget, the stated cost is \$5,305 per ET placement.

This dramatic five-year increase reflects a changing client base. At first, participants were the most readily employable people in the general AFDC population. For example, more of the early ET participants had high school diplomas (72 percent versus 60 percent today).

The first year, the program targeted two-parent families; one out of four participants were male. Today, five out of six are female, typically single parents who need child care not only to work, but to go through ET training programs as well.

The rising cost of ET:



As the more job-ready clients went through ET and into jobs, the emphasis has shifted to the long-term poor and those without basic employment skills. These are people who need help before they can step into the job market -- including literacy programs and adult basic education.

Will ET work in other states?



ET and economy worked together

It's important to note that ET is not like a piece of software that can be loaded into any state welfare system and run smoothly. Some of its success must be credited to the Department of Public Welfare, which had to sell ET both to employers and AFDC recipients, each typically wary of the other.

Credit also goes to the state's booming economy, which has created a labor shortage; in the last several years, unemployment has dropped from eight percent to under four percent. This has driven wages up and forced employers to consider candidates they might have ignored in a slower economy.

But the business community has gone beyond the demands of a thinning labor pool. Several large employers have helped design state-financed training programs for basic skills, and have then continued to train the ET graduates they've hired.

For those who would transfer the "ET success story" to other states, we caution you that there may be circumstances unique to Massachusetts that will affect the program's success elsewhere.

Savings to taxpayers

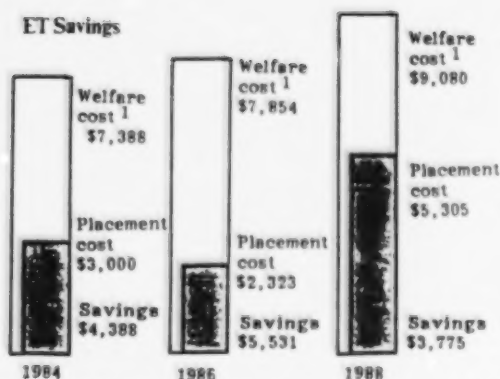
Taxpayers save through ET -- even through the more costly placement of "tougher" cases.

What do taxpayers save because of ET? Even though the projected cost per placement for fiscal 1988 is \$5,305, the average annual AFDC grant for a family of three is \$6,540. Add food stamps and medicaid, and you get an average total cost per case of \$9,080. The ET program saves taxpayers \$3,775 per placement.

To calculate the overall total, we have to look at the percentage of placements that resulted in closed cases or cases that never had to be opened.

We estimated that 60 percent of ET placements resulted in closed cases, and that those who leave welfare through ET would have been on AFDC for an additional year if not for the program. For our conservative estimate, we ignored participants whose grants were only reduced.

ET Savings



¹ Average AFDC benefit plus food stamps plus median cost of Medicaid services.

Using these assumptions, we project savings of at least \$150 million through fiscal 1988. That doesn't include new revenues the state collects from those who leave the welfare rolls for the tax rolls.

How does that compare with the cost of creating jobs? Again, it's hard to say. First, state government is not very good at creating private sector jobs. Second, even if new jobs are created, it's not clear they would go to the people now targeted by ET, many of whom lack the basic skills needed to get jobs.

Our estimate of what the state saves by operating ET is imprecise. We can't track individual welfare clients through the system to compare their actual benefits and use of services with the cost of their ET "tuition." We recommend that the Welfare Department include a detailed cost study in its contracted evaluation with the Urban Institute.

Benefits to the Participants

Participants net \$96 a week over AFDC -- other benefits intangible, can't be tallied.

The average wage earned by ET graduates in 1987 is \$12,940. The value of AFDC and food stamps for the average family of three is \$7,932 (this does not include Medicaid). The difference between working and being on welfare is \$96.31 a week.

Much of this typically will go for day care. To make employment more attractive, some welfare support services are extended in the first year: DSS day-care vouchers can add as much as \$3,000; Medicaid may be extended up to four months in some circumstances.

The department has a wage floor of \$5.00 an hour for ET graduates and is looking for higher wage offers. Of course, there are other benefits to some participants. After joining the ranks of the employed, ET

graduates may develop new skills and get better jobs later on. And, undoubtedly, most would rather support themselves than depend on the state.

Conclusion

So far, the investment in ET has paid off for Massachusetts. The savings to the state far outrun the cost of the program. Financial benefits to recipients are likely to improve, and there are other benefits we can't quantify.

Will ET continue to save money? That's unclear. Those entering the program now need more services than their predecessors, so the cost will continue to rise. On the other hand, these participants would use more of the state's welfare services, for a longer period, if they remained on AFDC -- so the investment could continue to pay off.

Another factor is that ET savings may increase. At first, about 60 percent of ET participants left the welfare rolls permanently -- in fiscal 1987, 77 percent did, possibly indicating that the program has become more efficient.

It's also unclear what would happen if unemployment in the state were to rise significantly. A faltering labor market could cut the number of jobs available to ET graduates, and its cost-effectiveness might suffer as a result.

But for now, at least, ET has proven itself an effective money-saver, by cutting a portion of the state's largest single budget item, human services.

And as long as ET pays its own way, and cuts welfare dependency, who would argue that it hasn't been a success?

Introduction

The Massachusetts Department of Public Welfare (DPW) began operation of the Employment and Training Choices Program (ET) on October 1, 1983. The goal of the program is to help recipients and applicants of Aid to Families with Dependent Children (AFDC) move from welfare dependency to economic self-sufficiency. The program is based on the belief that welfare recipients, when given a choice between welfare and work, will choose to work if given access to quality education, vocational training, job placement and other support services.

The department has maintained that without ET the AFDC caseload would be considerably higher than it is today, or that the success of ET has reduced the caseload. In fact, the caseload has continued to decline since federal policy changes made by the Omnibus Budget Reconciliation Act of 1981 (OBRA).

It is difficult at first glance to separate the impacts of various upward and downward pressures on welfare caseloads to attribute causes and effects. Opposite and unequal forces are at work in determining AFDC caseloads. ET is but one of these forces. This MTF evaluation seeks to identify the separate effects that the DPW's employment and training program and the healthy Massachusetts private economy have had on welfare caseloads. We also comment on the size and nature of the benefits and costs of the program.

Background

It is useful to examine the historical development of traditional welfare programs in our society and the barriers that tend to exclude AFDC recipients from successful participation in the private economy. This helps us understand how the ET program works and the problems that it encounters. It is also important to understand the demographics of AFDC clients and ET placements to make some judgments about whether or not the program is serving the whole AFDC client caseload or whether it is capable of doing so in the future.

Beginning in 1935, care for the poor became a responsibility of the federal government. Prior to that, local governments and private charities provided for the needy. The Social Security Act of 1935 is the foundation of today's welfare policy. The legislation created federal programs for old-age insurance, cost-shared public assistance, and social services for the aged, the blind, and dependent children. When these programs were created, no one ever imagined that they would grow to their present size and scope.

Welfare caseloads exploded in the 1960s. From December 1960 to February 1969, 800,000

families were added to the welfare rolls nationwide, an increase of 107 percent and eight times the increase of the previous decade. The cry for welfare reform began then and continues today.

The Dynamics of Welfare

Contrary to popular belief, most welfare recipients are on AFDC for a relatively short period of time. These "short-term" poor, who stay on the welfare caseload for two to three years, are more likely to be white and are better educated than the rest of the caseload. The "long-term" poor are more likely to be persons of color, have less education and less work experience or other labor market attachment.

Societal or Programmatic Change?

There has been much research to explain the rise in the welfare caseload. It has been suggested that one societal change greatly contributing to its rise is the decline of the agricultural sector. This in turn led to greater population mobility and urbanization. Urbanization contributed to the breakdown of the extended family and kinship support systems of pre-war society. Also, AFDC eligibility requirements are broader and benefits are more generous; public assistance is now more attractive than some of its alternatives.

The most prominent interpretation of AFDC caseload growth is that it occurred in response to the economic and social forces that have created the rise of the single-parent family. Much debate has centered around whether families modify their behavior to qualify for welfare benefits.

Labor-market Barriers

There are many more barriers to entry in the labor market for single women who head households than for men. The main factors that discriminate against a woman are her sex, race, skills and education level. Stratified and internal labor markets have tended to place women at the end of hiring queues. It has been suggested that employers are more reluctant to hire women because they tend to leave the labor force intermittently to have children. As a consequence, employers are less willing to invest in the job-specific training necessary where women are involved, especially when the employer pays for that training. Education and skill level deficiencies can be addressed by government services such as general education, job training and job counseling.

The single most important labor-market barrier to female heads of household is the issue of child care. Often, women are forced to weigh staying at home to care for their children and receiving welfare against entering the labor force and working. The choice is between adequate child care and

economic independence. The only way to help women on welfare out of this dilemma is to help provide adequate child care. Without the provision of day-care arrangements, an employment and training program for welfare mothers has no hope of success.

Other research suggests that prior labor force orientation and expectations of success or failure are also of great importance for the success of programs. Often these are self-reinforcing -- prior experience leads to greater expectation of success. This is especially true for women participating in employment and training programs. (See L. Goodwin, CAUSES AND CURES OF WELFARE, pp. 129-30.)

Welfare Reforms

Policymakers at the federal and state level have attempted reforms of the welfare delivery system for almost as long as welfare's own history. Part of that history includes efforts to reduce the caseloads through work and training programs for recipients.

In 1961 amendments to the Social Security Act allowed states to expand their AFDC programs to include two-parent families with an unemployed parent. As a result, welfare rolls swelled with able-bodied men. The Community Work and Training Projects were created in 1962 to prepare these individuals for return to regular employment and allow them to work off a portion of their welfare benefits. This program was expanded by federal legislation in 1963 to include work experience projects for AFDC mothers. In designing these programs, states were encouraged to offer social services aimed at the causes of personal dependency.

Work Incentive Program (WIN)

Congress established the Work Incentive Program (WIN) in 1967 to further stem the growth of the AFDC caseload. Its purpose was to move public assistance recipients from welfare to work through a combination of supportive services and training. The early focus of the program was on providing institutional training to improve the occupational skills of welfare clients.

AFDC caseloads continued to grow despite WIN. Congress reacted by passing the Talmadge Amendments to the Social Security Act in 1971. These amendments tightened the WIN program. They made program registration mandatory for most adult AFDC recipients and the program's emphasis was shifted from training and support services to immediate job placement.

The WIN program underwent even further change in 1975. Clients first applying for welfare now applied with the local WIN employment and training staff rather than at the welfare

department. There they were exposed to labor market information and immediate efforts were made to place them in jobs. The thrust of the program became to place persons first applying for AFDC into jobs and avoid their ever going on the caseload. Additional emphasis was put on the direct employment of the most job-ready participants. The supportive services component of the WIN program was even further de-emphasized.

Work Incentive Demonstration Projects (WIN Demos)

Recognizing that WIN had failed to reduce the AFDC caseload, Congress enacted sweeping changes in AFDC eligibility in the 1981 Omnibus Budget Reconciliation Act (OBRA). These eligibility restrictions reduced the AFDC caseload in Massachusetts from 120,548 in October 1981 to 95,051 in July 1982. Simultaneously, OBRA included provisions which allowed states to institute workfare (work for welfare) programs or to initiate other WIN demonstration projects as a substitute for the regular WIN program. The purpose of the demonstration projects was to "test states' ability to develop alternatives to current AFDC work requirements." These demonstration projects were to last three years. The Secretary of the Department of Health and Human Services (DHHS) is responsible for evaluating these projects after the first year and when they expire.

The WIN Demonstration Authority made significant changes in the operation of the program. One change was the creation of a loose federal management and reporting structure under DHHS. Under the regular WIN program, the Department of Labor and DHHS had joint responsibility for administration of the program. OBRA also made the state welfare agency the operating agency; under the regular WIN program, DPW and the Division of Employment Security (DES) split responsibility for running the program at the state level. The perception was that the fragmentation of authority between employment security and welfare offices at both the federal and state levels contributed to WINs lackluster performance in reducing the AFDC caseload. States with demonstration projects are still required to make registration mandatory for AFDC fathers and mothers with children over the age of six, but the authority for design and operation of the program was greatly decentralized to the states. In essence, OBRA gave states the leeway to tailor the programs to fit their own needs and the incentive to pump more money into them.

Massachusetts WIN Demos

Under the King administration, Massachusetts started a WIN demonstration project in 1982, the Work and Training Program (WTP). When an effort to introduce a workfare component failed, WTP was run as a more traditional work and training program. Its priority was, however, immediate job placement.

WTP was barely off the ground when the second Dukakis administration took office. In 1983, the new administration replaced the WTP program with the Employment and Training Choices Program (ET). The ET program is designed so that individuals may choose the component most suited to their career needs from several training, educational and job placement options. The administration has emphasized "self-motivated client participation." In other words, registration is mandatory as required by the WIN-Demo legislation, but participation is not.

It is interesting to note that this is an indication that policy has come full circle. The original WIN program emphasized institutional training and support services, too. Registration was also mandatory in the original program, but participation was effectively limited to volunteers because caseloads greatly exceeded the number of training slots. The ET program offers a wide range of education, training, job placement and support services for those who participate.

Assessment and career planning services are available to clients at all of the local welfare offices. After counseling, most of these clients enter into another ET component, usually training and placement services.

Skills training is also provided to help clients improve or develop marketable skills. Many of the skills training programs are offered through the Job Training Partnership Act training programs but the ET program directly funds other vocational education and skills training services, including the quasi-public Bay State Skills Corporation (BSSC). In addition to these traditional job training components, ET also offers a Supported Work program for those with little or no recent employment experience. Supported Work gradually increases a participant's responsibility in the workplace, and offers peer support and job-related counseling. Supported Work participants are often hired by the firms that they train in, once they have acquired the necessary skills.

Many of the ET clients lack the basic skills necessary to succeed in the above training programs and, hence, the labor market. To overcome this obstacle, the program offers clients access to courses in English as a Second Language, Adult Basic Education, and General Equivalency Diploma. For clients with higher goals, recipients may take one or two courses related to their vocational goals at Massachusetts community colleges.

Job development and placement services are provided to ET participants by DES; these services are short-term and limited to training in job-hunting techniques.

In addition to the counseling, education, training and placement services, the department offers ET participants an array of support services. DPW has contracted with the Massachusetts Department of Social Services (DSS) to provide a system of voucher day-care for ET participants, and directly pays up to \$10 a day for validated baby-sitting services arranged by the participant. Participants are also eligible for reimbursement of up to \$10 a day for verified transportation expenses.

Recognizing that many ET clients need continued assistance after they have found employment through the program, the department provides extended benefits to eligible graduates. Day-care vouchers may be extended for up to one year after a welfare case is closed. The vouchers may be extended further if slots are available. These vouchers cover part of the day-care cost, as determined by a sliding income scale. The individually arranged baby-sitting is reimbursed for one month after employment starts, three months if DSS child care slots are unavailable. Medicaid eligibility is also extended for up to four months.

Since 1983, the Department of Public Welfare's ET program has placed over 30,000 AFDC recipients into jobs. Its initial success was with the Unemployed Parent caseload. In the first quarter of 1985, 38 percent of the job placements made by DES under the ET program were men, even though they only constitute 4.7 percent of the total welfare caseload. The department estimates that ET has saved the state over \$100 million in calendar 1986 after subtracting program costs. This estimate is based on case closings and grant reductions. Some individuals may have returned to the caseload, but they are not counted in this savings estimate.

Governor Dukakis' budget recommendation for fiscal 1988 includes \$22.8 million to achieve another 12,000 job placements. Another \$34.9 million is included in the recommendation for voucher day-care for 9,800 children of ET participants. Fiscal 1987 costs for day-care are expected to average \$3,567 per voucher slot.

As the Dukakis administration promoted ETs success and linked it to the continuing decline in the AFDC caseload, it seemed important to separate the program's effects from the impact of the Bay State's prosperous economy. The administration argues that the AFDC caseload has risen in previous eras of low unemployment. Their argument seems to be that the economy didn't affect the caseload then, but now we have ET. We contend, however, that the state's economy has shifted and other demographic changes have occurred since the 1970s that could explain the different experiences of the two time periods. If the outstanding performance of the Massachusetts economy is the driving

force behind the decline of the welfare caseloads since the OBRA changes, then it raises questions about the state's rapidly increasing investment in ET.

Another factor ignored in the caseload drop is the possible continuing effects of OBRA. OBRA made dramatic changes in the AFDC program by capping income at 150 percent of the state standard of need (since raised to 185 percent), limiting full work-related deductions to four months, and counting stepparents income. These policy alterations transformed AFDC from a program of long-term assistance to families to one of temporary aid. These eligibility restrictions may restrain the growth of the caseload despite upward pressures exerted by demographic changes (e.g., an upsurge of single-parent families, many of whom are teenage pregnancies) and benefit increases.

Methodology

In an attempt to resolve the debate, MTF has developed a regression equation which explains the welfare caseload as a function of the employment level in the state's economy and as a function of ET program activity. It should be made clear that this discussion is limited to the AFDC portion of the ET program. The time period under study is from the beginning of the program in October 1983 through November of 1986, the last month for which data on ET registrations, participations and placements were available.

Our underlying assumption is that the economy of Massachusetts has performed so well in terms of the personal income growth and low unemployment that a great number of people would naturally be pulled up from the ranks of poverty, to borrow from the "rising tides lift all boats" analogy. On the other hand, Commissioner Charles Atkins of the welfare department points out that from 1975 to 1978 the unemployment rate was cut in half, and the welfare caseload increased. Adjustments made for eligibility changes and benefit increases do not explain the caseload increase of the 1970s. This suggests that there may have been large numbers of people in "leaky boats" that missed the "rising tide".

One possible explanation for the different experience of the two periods is that sufficient structural change in the economy has taken place to account for this difference. First, in 1976 the economy was pulling out of a severe national recession, a recession that hit Massachusetts more severely than other states. This period was before the take-off in the finance, trade and service sectors. The deregulation of financial institutions has created tremendous growth in that sector in the 1980s. Rising personal incomes and the relative shortage of housing has spurred on the real estate and

construction sectors. The economic rebirth from 1975 to 1978 was a recovery of the older, more traditional industries of Massachusetts. Workers idled by the recession were recalled. Unemployment rolls declined, but welfare rolls did not. We would argue that other factors were driving caseloads up and dominating the positive effects of the economic recovery in the mid-1970s.

Another possible explanation is that a movement from a 12 percent unemployment rate to a six percent unemployment rate is quite different than a movement from eight percent to four percent. The relative tightness of the labor market is making it more difficult to attract workers. This drives up wage rates and raises the economic reward for leaving the welfare rolls. With labor in short supply, employers are more willing to hire workers they may not have considered before.

On the other hand there is some evidence to support Commissioner Atkins' assertion that the economic success story of Massachusetts in the 1980s need not translate into a reduction in welfare caseloads. One monograph by Sheldon Danzinger and Peter Gottschalk states that "there are simply too many poor households to benefit directly from improved labor market conditions." Two-thirds of poor families are headed by students, mothers of young children or the elderly; people not expected to work even when employment opportunities are more abundant and attractive. Danzinger and Gottschalk argue that the antipoverty effect of rising average incomes may be offset by increasing inequality. They found that economic growth had a large antipoverty effect in the 1970s. They also suggest that the impact of growth on poverty will be diminished in the future because of fewer people being near the poverty line and the greater distance between the poverty line and the median income level.

Other research also documents the unemployability of large numbers of the caseload and demonstrates that many of them could not match their welfare incomes with their earning capacity. This evidence is dated and, at least in Massachusetts, entry level wages in a number of low-skilled sectors have been bid up sufficiently due to labor shortages that earning capacities are now greater.

In an effort to better understand the dynamics of the caseload, and to correctly attribute it to the economy or to the ET program, we have performed a regression test that statistically isolates the independent effects that various factors have on the AFDC caseload. In particular, we want to identify the relative magnitudes of the ET program and the Massachusetts economy.

To develop our equation, we first started by searching the literature on the evaluations of ET-type programs, beginning with the evolution of welfare-related work and training programs. There is a great deal of published research on the WIN program. Another body of literature exists on the relation between welfare, women and work and on the dynamic by which people enter and leave welfare through work and changing family relations.

In this first stage, MTF interviewed persons involved in all phases of ET. This was an important stage of the analysis. It provided the greater understanding one needs to correctly identify the mathematical relation between welfare caseloads and ET. Among the people we met with to discuss ET were the Research Director of the state DES, DPW officials from the commissioner to Financial Assistance Social Workers (FASW) and ET workers in local welfare offices. We made visits to contracted vendors of training services and ET participants at those training sites. We interviewed a personnel officer from a large financial institution that employs many ET participants in the supported work component, and a clerical supervisor at that same institution who supervised the ET clients.

Armed with a better understanding of welfare, ET and the transition off the caseload, we developed a series of equations to try and place the credit for the caseload decline with the ET program, or with the economic success and job creation performance.

The regression equations we developed were subjected to four evaluation criteria before we accepted their results. For the technically minded reader, Appendix One contains a full discussion of the evaluation process and the intermediate equations we used to arrive at the final four equations.

The equations take the general form:

AFDC Caseload = $a + b \cdot \text{ET variable} + c \cdot \text{employment variable} + \text{an adjustment for policy changes}$

The ET variable that emerged in the final form was monthly participation levels lagged three months (PRTL3). That is, for each monthly observation of the caseload we included the ET monthly participation level from three months earlier. Alternatively, we tried registrations and placements as a measure of ET program activity without success. AFDC clients or applicants register for the program but may not participate for months, if ever. So it is no surprise that registrations have no significant impact as an explanatory variable. Placements tend to be lumped around the end of training programs. The lumpiness of placements makes it difficult to isolate their impact on the caseload in

the equations and diminishes their significance as an explanatory variable. Participation levels are the most likely indicator of ET activity. Participation is not likely to have an immediate impact on the caseload since program activity is likely to last several months before a case is closed. Lagging participation levels by three months produced the best results.

Different employment variables were included in the final four equations: total non-agricultural employment in Equation 4 (EMPLOY), service sector employment in Equation 5 (SERV), wholesale and retail trade employment in Equation 6 (TRADE), and finance, insurance and real estate employment in Equation 7 (FIRE). The major policy change that had to be accounted for during the study period was the extension of benefits to pregnant women in their first and second trimesters.

We chose Massachusetts employment level as a measure of the strength of the economy. Better measures of economic activity are likely to be incomes or outputs, but employment is highly correlated to incomes and output and is reported monthly in a reliable form with a much shorter reporting lag than the other measures.

In addition to gross employment levels, we tried equations that included unemployment and the unemployment rate. These additional terms were added in separate equations to try and capture the differences caused by any change in general employment levels, i.e., employment hasn't grown much but the relative pool of unemployed has shrunk. In the end, we dropped these terms because they were found to be insignificant in all of the equations and in both forms. Part of the reason that they may seem insignificant is that during the period of ET, the unemployment rate in Massachusetts has been the lowest of all the industrial states. After declining in the first part of the period, it has not moved around very much, mitigating our ability to measure its effect. The impact of unemployment may be more apparent in other time periods when it was more volatile.

Underlying the change in the level of AFDC caseloads were eligibility and benefit changes that occurred during the study period. It is important to incorporate these into the statistical model so that their impact is not incorrectly attributed to other variables. With the help of the DPW's Budget Office we compiled a list of all the eligibility and benefit changes that took place since 1981 (see Table 1, next page). We also spent some time with one of their analysts to get a sense of the relative impact these changes had on the caseload, and the timing of these impacts.

Table 1

Welfare Policy Issues Affecting Caseload FY 1983-1986

Major Downward Pressures:

October, 1983 ET Begins

Major Upward Pressures:

September, 1982	\$75 clothing allowance per child
September, 1983	\$125 clothing allowance
October, 1983	Emergency Assistance caps Removed
January, 1984	5 percent Standard of Need (SON) Increase
July, 1984	4 percent Payment Standard Increase (COLA)
September, 1984	\$125 clothing allowance
October, 1984	Increase in eligibility standard from 150% of SON to 185%
October, 1984	\$50 child support disregard payment
January, 1985	5 percent Standard of Need Increase
January, 1985	Benefits 1st or 2nd Trimester
July, 1985	9 percent Standard of Need increase (COLA)
September, 1985	\$125 clothing allowance

Through this process and with some further statistical analysis, we identified an eligibility change with such a major effect on the caseload that it was necessary to explicitly build it into the model. This was the extension of eligibility to pregnant women in their first and second trimesters. Dummy variables were introduced to separate the effect of this change from the ET and employment effects. Further discussion of the dummy variables is left to Appendix One.

This brings us to Equation 4, the first substantive equation. It takes the specific form:

$$\text{AFDC Caseload} = 125,359 - 1.07 * \text{PRTL3} - 0.013 * \text{EMPLOY} + \dots$$

The coefficient on PRTL3 tells us that for every participation in ET, the caseload declines by one after three months. The EMPLOY coefficient tells us that for every 1,000 new jobs that are added, the caseload will decline by 13 cases.

Employment and the ET program both cause the welfare caseload level to go down. This forces us to reject our null hypothesis that the Massachusetts economy is solely responsible for the decline in the welfare caseloads. The coefficient on PRTL3 would have to be significantly close to zero and the coefficient on EMPLOY would have to be significantly less than zero for us to accept our null hypothesis. It also forces us to reject the alternative hypothesis that ET alone is responsible for this decline. This requires that the PRTL3 coefficient be less than zero and the coefficient for EMPLOY be close to zero. An acceptable alternative does present itself: Equation 4 shows that the strong labor market and the ET program both caused the welfare caseload to go down.

Equation 4 cannot tell us what would have happened to the welfare caseload in the absence of either a strong labor market or ET, but it does allow us to compare their relative effects. The coefficients show us a nearly one-to-one participation impact and a 1,000-to-13 employment impact. Comparing the effects of program participation and employment levels is a little like comparing apples and oranges. We are trying to compare the impact of a program with an average monthly participation level of 1,961 to the effect of an employed work force that is approaching three million.

Standardized coefficients help us make this comparison. The standard coefficients normalize the variables by their standard deviations. Expressing the impacts in terms of standard deviations makes it more difficult to visualize the impact, but it facilitates comparison because they are measured in the same units as the variables.

The standard coefficients in Equation 4 suggest that the caseload declines 1.56 times more for an increase of one standard deviation in employment than for a standard deviation increase in program participation. From a policy perspective, the standard coefficients indicate that the creation of 7,575 new jobs will reduce the AFDC caseload by 100 cases; 82 additional ET participants would achieve the same reduction in the caseload.

These figures must be used in a relative, not an absolute, sense. Standardized coefficients only hold when all of the variables are at their average and one variable changes by one standard deviation. They are not meant to be interpreted as absolute indicators of a single variable's effect, but to compare the relative effects of two different variables.

State government's ability to create jobs is usually questionable. More often, one thinks of the federal government and national economic policy as being more effective at job creation because of the leakages in the smaller, more open state economies. Work and training programs for AFDC recipients are likely to be a better policy for reducing the caseload than attempting to increase state employment. The numbers suggested in the previous paragraph reinforce this view.

Differences in Industrial Employment

The economic structure of Massachusetts is much different today than it was in the mid-1970s. The manufacturing sector accounted for over a quarter of total employment in 1975 and 1978. Today it accounts for only one-fifth of Bay State employment. The five percentage points that manufacturing employment has lost have been picked up by the service sector. Services provided 22 percent of all jobs in 1978, over 27 percent today. Sizeable gains have taken place in trade, construction, and finance, insurance and real estate (FIRE). Table 2 shows in detail the very different performances of the industrial sectors in the two time periods.

Some evidence suggests that the skill levels of AFDC clients are best suited for employment in the low-skilled trade and service sectors and for clerical positions

in the financial sector. Further, these sectors have created more employment opportunities in the 1980s than other industries, and that makes it easier for participants to leave the welfare rolls. In fact, during one six-month period, 58 percent of all ET placements were made in these sectors (clerical 28, service 18 and packing/handling 12 percent).^{*} This evidence questions whether the investment in ET is justified under this set of conditions.

On the other hand, our statistical analysis shows that the ET program did have a significant effect on the caseload. A natural follow-up question is whether the program's impact is as large when the employment variable is limited to the trade, service and FIRE sectors. That is, what happens when we substitute employment in various industrial sectors for EMPLOY in the equation discussed above?

The service sector is the largest of the three sectors, accounting for 27.55 percent of total employment at the end of 1986. Service sector employment during the study period grew by 17.2 percent compared to 12.7 percent growth in total employment.

When we repeat the regression equation with service sector employment (SERV), the

Table 2

Non-Agricultural Employment in Massachusetts (000)

	1975	1978	% change	1983	Nov. 1986	% change
Manufacturing	577.8	652.1	12.8	624.3	624.4	--
% of total	25	26		23	21	
Durables	342.9	406	18.4	406.1	417.3	2.3
% of total	15	16		15	14	
Non-durables	234.9	246.1	4.8	216.2	207.1	-4.2
% of total	10	10		8	7	
Construction	74.2	72.8	-1.9	80.5	124	54.0
% of total	3	3		3	4	
Transportation, Communication & Utilities	113.7	117.3	3.2	118	130.3	10.4
% of total	5	5		4	4	
Trade	511.8	547.3	6.9	602.1	715.3	18.8
% of total	23	22		23	24	
Finance, Insurance & Real Estate	135.8	146.7	8.0	170.3	202.9	19.1
% of total	6	6		6	7	
Services	494.7	560.9	13.4	707.2	829.1	17.2
% of total	22	22		26	28	
Government	363.1	429.2	17.6	368.8	382.4	3.7
% of total	16	17		14	13	
Total	2,273.1	2,526.3	11.1	2,671.2	3,009.8	12.7

^{*}DPW promotional material dated 1/15/86 covering 7/1 - 12/1, 1985.

coefficient is almost four times as great as the EMPLOY coefficient in Equation 4 (see Equation 5 in Appendix One). The SERV coefficient is larger, in part, because service sector employment is smaller than total employment. The two equations are describing the same basic relationship, so the SERV coefficient has to be larger.

The standard coefficient for SERV is also greater, -1.101 versus -0.753. This suggests that there is more impact from service sector employment than the raw coefficient alone tells us. The impact of employment was 56 percent greater than ET's impact in Equation 4. In Equation 5, service sector employment is more than twice the impact of ET. The equation does overstate the importance of the service sector, but still indicates that the growth of service sector jobs has been more important than the growth of total employment in explaining the change in the welfare caseload.

Equation 5 still does not indicate that the administration should shift its efforts from employment and training for AFDC recipients toward general job creation. The results do indicate that, at the average, 1,894 service sector jobs would have to be created to achieve 100 case closings; 80 more ET participations would have the same effect. While it is easier for state government policymakers to promote job creation when that effort is targeted to a specific sector, the service sector is the least likely candidate. Service establishments are small and very diverse. State government policies to promote small business might promote more activity and employment in the services, but maximizing the disposable income of state residents would be at least as effective in contributing to employment growth in this sector.

The trade sector is the next largest of the three sectors given additional consideration, accounting for 23.8 percent of Massachusetts total employment in 1986. Growth in trade employment from 1983 to 1986 was even more dramatic at 18.8 percent. The absolute size of the coefficients for trade employment and ET participation are both lower in Equation 6 than the service employment and program coefficients in Equation 5. We had expected the industrial employment coefficient to be larger because the trade sector is smaller than the service sector and, here, trade is also explaining the effect of total employment on the welfare caseload.

Comparison of the standard coefficients shows that the effect of employment in the trade sector was smaller than the effect of service sector employment, but somewhat more important than total employment. Employment in the trade sector has an 83 percent greater impact on the caseload than program participation. This also means that

employment and program participation levels both need to be increased relatively more to achieve 100 case closings. According to the statistics in Equation 6, employment in wholesale and retail trade would have to increase by 2,492 from the mean, and program participation levels by 94, as compared to 1,894 service sector jobs and 80 participations as in Equation 5.

Given the smaller impact of employment in trade on welfare caseloads, it still appears that the best course for government policy is to continue the ET program to achieve a reduction in the welfare caseload.

Employment in finance, insurance and real estate firms (FIRE) accounted for almost seven percent of total state employment in 1986. Employment growth in this sector from 1983 to 1986 was 19.1 percent, second only to the growth of the construction industry. As expected, the raw coefficient for FIRE is much larger than for any other of the employment variables we examined. The relatively small FIRE sector is trying to explain not only the effect that it has on the caseload, but the effect of all employment that is not included in the equation also. Still, the results in Equation 7 show that FIRE employment has one-fifth the power of program participation in reducing the AFDC caseload.

Comparison of the standard coefficients shows that finance, insurance and real estate employment had 3.7 times the impact on caseloads as program participation.* Extending the analysis as we did above, the standard coefficients in Equation 7 suggest that, at the average, we can reduce AFDC cases by 100 with the addition of 442 new jobs in finance, insurance and real estate. The increase in participation needed to achieve an equivalent reduction is about the same as in the other equations; 83 additional participations will yield 100 case closings. Clearly, if the state decides to reduce the caseload through job creation programs, it should target its efforts to this sector.

* For a standard deviation increase in FIRE when all variables are at their average, compared to an equivalent increase in program participation.

Limitations to the approach

9

The main limitation to this approach is that the specifications of the equations miss other important explanatory variables of the AFDC caseload. No account is made for a number of upward pressures on the caseload; no demographic variables are included to show the changes in the population of potential AFDC applicants. The only included explanatory variables are employment, program participation and the major policy change that occurred during the study period. The impact of the variables not included (teenage pregnancies, single-parent families, etc.) are being picked up by the terms that are included. If these other factors are being swept up by the ET and/or employment variables, the coefficients are higher or lower than they ought to be.

Another question is whether it is appropriate to focus on the implications of the standard coefficients. The changing industrial composition of employment has produced many subtle changes. Also, ET has taken some time to evolve. Employers and clients both have had to learn to trust the

claims made about the program. Therefore, it may be inappropriate to compare the impacts of two dynamic variables by comparing the impact of their standard deviations over the three-year period.

Is the investment worth the cost?

In a study of the performance of government policy, it is important to consider what variables policymakers can control. As previously stated, it is almost certainly easier for state policy to increase program participation than to increase employment by enough to reduce the caseload substantially. And, even though the standard coefficients show the economy to have a larger effect on the caseload than ET, our analysis demonstrates that the program has had a significant effect on the welfare caseload. While the magnitude of the program's effect is only half as great as employment, the evaluation is still very positive considering the very low impact accorded to many prior attempts at employment and training, both in Massachusetts and elsewhere. The question that remains is whether the program is justified on the basis of its costs and benefits.

Table 3

The Cost of ET

	Fiscal 1984	Fiscal 1985	Fiscal 1986	Fiscal 1987 ¹	Fiscal 1988 ²
Funding Sources:					
State Expenditures	\$ 8,430,069	\$ 3,138,225	\$ 3,731,294	\$16,525,000	\$22,805,061
Voucher Day Care	3,925,818	8,808,574	17,993,409	21,423,746	34,866,776
Federal WIN Funds	5,766,410	7,957,187	6,182,231	13,400,000	6,000,000
Total	\$18,122,297	\$19,903,986	\$29,906,934	\$51,348,746	\$63,671,837
Costs & Benefits Compared Per Case					
ET Placements	6,040	11,089	12,870	10,000 ³	12,000 ³
Cost per Placement	\$3,000	\$1,794	\$ 2,323	\$ 5,134	\$ 5,305
Average annual wage earned by ET graduates					
ET graduates	\$10,400	\$10,504	\$11,336	\$12,940	--
Average annual AFDC grant					
AFDC grant	\$4,800	\$5,002	\$5,242	\$6,192	\$6,540
Food stamp benefit	\$1,788	\$1,844	\$1,812	\$1,740	\$1,740
Median Medicaid cost	\$ 800	\$ 800	\$ 800	\$ 800	\$ 800
Total Benefits	\$7,368	\$7,646	\$7,854	\$8,732	\$9,080
Savings to Taxpayers					
Savings per case closing	\$4,368	\$5,852	\$5,531	\$3,596	\$3,775
Savings (.6 x placements x savings per closing)	\$15,902,112	\$38,935,697	\$42,710,382	\$ 21,568,000	\$ 27,180,000
Cumulative Savings	\$15,902,112	\$34,837,809	\$97,548,191	\$119,136,191	\$146,316,191

1. Appropriations through May, 1987

2. Governor's budget recommendation

3. DFW estimates

4. For a family of three in private housing including clothing allowance and rent supplement.

There are two levels on which a cost-benefit analysis of the program can be conducted. At the first level, we have to decide whether the cost of training and support services is justified by savings to the taxpayers in the form of reduced welfare payments. The second level is to decide whether or not the benefits from leaving the welfare rolls exceed the costs for the individuals that participate in the program.

Table 3 shows the increasing state investment in the ET program. State funding for program costs and day-care have increased from \$12.4 million in fiscal 1984 to \$57.7 million in fiscal 1988. The cost per placement has also increased dramatically from \$3,000 in fiscal 1984 to \$5,305 in the governor's fiscal 1988 budget recommendation. The increase is even more dramatic if we start with fiscal 1985, the first full year of program operation, when the average cost per placement was \$1,794.

There are two reasons for this sharp increase in cost per placement. First, participants in the program tended to be more job ready than the average AFDC recipient in the first year: A greater proportion of participants had past work experience than the total AFDC population (87 percent versus 73 percent); that work experience was usually more recent (69 percent had worked within the last two years versus 31 percent); And, a greater proportion of them had high school diplomas (73 versus 50 percent). Also, a larger share of first year participants were male, 29.5 percent compared to 6.4 percent of the total AFDC caseload. Two-parent families were targeted for participation in the first year. Male participation has fallen as the unemployed-parent caseload has declined.

Second, as the more job-ready clients of welfare went through ET and into jobs, the program's emphasis has shifted toward clients who need more services to prepare them to participate in the labor market. The focus of the program has now shifted to the harder-to-employ and long-term poor. Today, the differences between ET participants and the total caseload have narrowed: 84 percent of participants have prior work experience compared to 82 percent of the AFDC population. Participants also tend to be less educated than when the program began: 60 percent now in ET have high school diplomas (72 percent did in the first year) compared to 52 percent of those on welfare (50 percent in ET's first year). As a result, program resources have been shifted to literacy programs and adult basic education courses that prepare clients for skills training components.

While the cost per placement will increase to an estimated \$5,305 for the next fiscal year, the average cost is still less than the average annual AFDC grant of \$6,540, for an annual savings of \$1,235. Adding the average food stamp cost for an AFDC family

of three with no other income and the median medicaid cost brings the total cost per case to \$9,080 for a net savings of \$3,775 per placement.

To extend individual savings it is necessary to adjust the number of placements by the proportion that resulted in closed or "never opened" cases. As of June, 1986, 59 percent of ET placements resulted in case closings or cases that never opened and 18 percent of ET graduates experienced grant reductions. The remaining 23 percent of graduates were still on the AFDC caseload. This is an improvement from the year before when more than 35 percent of those placed were either back on the caseload or had not yet experienced a grant reduction. To produce a conservative estimate, we used a 60 percent figure for case closings.

We further assume that those who leave the caseload through ET have reduced their stay on welfare by one year. No adjustment is made for grant reductions. The projected savings from the program were calculated in this manner for a cumulative total of \$146 million through fiscal 1988. This estimate is not as precise as we would like it to be. Too much reliance is placed on statewide averages, but, as a conservative approximation, our estimate shows a sizable savings to taxpayers.

To obtain a more accurate estimate of the actual program savings, more of the underlying detail on program participation and outcomes is needed. It would be necessary to track individual clients and calculate savings on a case-by-case basis. We may want to reduce our estimate of program savings to account for someone who has used less than the median value of medicaid services, or increase our savings estimate for someone whose stay on welfare is reduced by more than one year. More information about individual situations is also necessary to calculate the taxes paid by ET placements. Also, case closings for ET participants have increased of late: 77 percent of ET participants left the caseload in 1987. If the trend toward a greater proportion of case closings continues, our savings estimate is too low for 1987 and 1988. A more precise cost-benefit analysis of this nature is beyond the scope and resources of this effort, but we urge the department to include a more complete cost-benefit analysis in its contracted evaluation with the Urban Institute.

In any event, it is clear that the program's cost are rising. This is not very disturbing considering the change in the composition of the participants. The participants of the future are likely to need even more services for a positive program outcome. As costs per placement increase, net savings are also likely to be less. On the other hand, ET will be placing

AFDC clients and applicants who would be on the caseload a longer than average length of time, and tend to increase ET savings. It is hard to determine which of these conflicting forces will dominate.

At the second level, Table 3 shows that the average annual wage for full-time placements in 1987 is \$12,940. The value of welfare benefits for a family of three including food stamps is \$7,932. The difference is \$5,008, or a wage differential of \$96 per week. Some ET support services are extended in the first year to make the difference more attractive: day-care placements with DSS vouchers can add as much as \$3,000 and Medicaid eligibility may be extended up to four months in some circumstances. The department does have a wage floor of \$5.00 per hour, and is actively trying to win even higher wages for ET graduates. Still, it appears that the ET program is doing more for taxpayers than it is for individuals on welfare.

Conclusions

We set out to determine whether the booming state economy or the Department of Public Welfare's Employment and Training (Choices) Program brought about the AFDC caseload decline of the mid-1980s. What we discovered is:

- o the program is successful because it is designed to remove the barriers to labor market participation that many welfare clients face;
- o both ET and the economy have contributed to the sizable decline of the AFDC caseload;
- o whatever the reason for Massachusetts' economic success, ET could never have achieved its level of success without the concurrent economic success;
- o despite the role of the economy, it is still easier for state government to reduce the caseload by increasing ET participation than by raising the rate of employment;
- o trade, service, and finance, insurance and real estate employment had a greater impact on the caseload than did employment in other sectors;
- o the program will have saved taxpayers at least \$150 million through the end of fiscal 1988; and,
- o ET benefits both taxpayers and clients.

Since we began our study, ET has attracted even more attention with Governor Dukakis' announcement as a presidential candidate. Those who are interested in transferring the ET success story to other states should be cautioned that there are a number of circumstances unique to Massachusetts that may affect the program's success elsewhere.

In the 1980s Massachusetts is experiencing an extremely tight labor market. Population growth is slower here than in most parts of the country because birth rates are low and in-migration is discouraged by the high cost of living. Higher than average rates of female labor force participation diminish that possibility for expanding the labor force. These factors have contributed to a local labor shortage and forced employers to seek alternative sources of labor. As a consequence, the possibility for success through ET was greatly improved.

We are not suggesting that the ET program will not work elsewhere, only that one reason for the high degree of success that it has enjoyed in Massachusetts is because of high labor demand and low labor force growth. ET-like programs can work in other states, but they may be less successful if the local economy is unable to provide a sufficient number of jobs for graduates. A more limited voluntary employment and training program that targets training efforts in sectors where jobs are most abundant and provides support services, especially day-care, will achieve the most success.

Where possible, the program should try to access preexisting public-private partnerships for job training. ET has relied heavily on other public training programs like the BSSC, and private training vendors who have worked with local Private Industry Councils established by JTPA. An ET-like program should also try to gain the cooperation of the state's largest employers. A number of large high technology, manufacturing and finance employers in Massachusetts have been very supportive of the program. Their contribution to training and employment of ET participants has been considerable.

The future for ET in Massachusetts is hopeful. The state economy is unlikely to falter in the near future. The local labor shortage will persist and employment opportunities for participants will be plentiful. Department of Public Welfare efforts to raise starting wages will benefit participants and encourage even greater participation. Program costs per placement are increasing because the people now entering ET require more training than previous participants, but the increased costs will be offset since these people would also stay on welfare longer without the program.

Appendix

This appendix describes in detail the regression equations and how they were developed. It discusses the obstacles that we ran into along the way, how we resolved them, and, finally, how the results led us to our conclusions. It is intended as a supplement to the main report for those interested in the method and development of the model. It is not meant to be a replacement for the main report or to be read separately.

Data and Specification Issues

The original intention of our research was to develop a regression test of the following null hypothesis: The cited reductions in welfare caseloads are due to the outstanding performance of the Massachusetts economy rather than the ET Choices program.

The first step in modeling any problem is to perform some basic research on the issue in question. In developing a theoretical form for the regression, one needs to make it a sensible test of the research question. The old maxim, "ask a silly question, get a silly answer," applies to econometrics as readily as it does to anything else. The background study is described in the body of the paper.

Some peripheral issues did arise along the way. At one stage we considered extending our analysis to model work and training programs in general with the caseload and the economy. We were concerned that data from ET alone did not provide a sufficient number of observations to yield significant results. However, we encountered a major problem with the availability and consistency of data on participation and outcomes.

Another source of data that would give us a longer historical period to study is the DPW's monthly reports on the WTP program in the King administration. An argument against this approach is that WTP and ET are very different animals and both were very different from the WIN program.

Robert Broker, regional director of the federal WIN program, pointed out that the environmental factors were so different pre- and post-OBRA that splicing the data sets would be meaningless. Collecting the data on a monthly basis in the post-OBRA era would have given us 24 more observations, 14 months of WIN and 10 months of WTP. The data that we received on the earlier Massachusetts WIN-demo (WTP) from the federal Office of Family Assistance was not detailed enough for us to use. We did get comparable data from DPW's Research, Planning and Evaluation Unit (RP&E). After running some initial regressions and performing likelihood tests on the three programs (WIN, WTP and ET), we found that the programs were significantly different. We concluded that splicing the data sets would be fruitless.

The differences between the three programs can be explained several ways. First, the WTP program was barely under way before it ended. The history of WTP is not long enough to model the relation it may have had to the caseload and the economy. The same is true of the post-OBRA WIN observations. When we attempted to account for these differences by including dummy variables, we found the statistical differences too large to put both programs in a single equation.

In our meeting of March 26, 1986, Commissioner Atkins suggested that the relationship between welfare caseloads and case closings is not a simple inverse relation. There are independent upward and downward pressures on the caseload such that we may want to change the dependent variable to case closings. We investigated this possibility and found, instead, that we could model the caseload and account for the most significant of these upward pressures. In the time frame of ET the largest change in eligibility and the single largest source of upward pressure on the caseload has been the extension of benefits to pregnant women in their first and second trimesters. We were easily able to account for this policy change with dummy variables.

Below are several equations that we tested as possible specifications of the relation between the AFDC caseload, ET as a tool to manage the caseload and the Massachusetts economy:

$$H0(1): WELF = \text{CONSTANT} + b \cdot \text{PARTS} + c \cdot \text{EMPLOY}$$

$$H0(2): WELF = \text{CONSTANT} + b \cdot \text{PARTS} + c \cdot \text{EMPLOY} + d \cdot \text{RATE}$$

$$H0(3): WELF = \text{CONSTANT} + b \cdot \text{PARTS} + c \cdot (\text{EMPLOY} - \text{TRADE}) + d \cdot \text{TRADE}$$

$$H0(4): WELF = \text{CONSTANT} + b \cdot \text{PARTS} + c \cdot \text{EMPLOY} + d \cdot \text{SERV}$$

$$H0(5): WELF = \text{CONSTANT} + b \cdot \text{PARTS} + c \cdot \text{FIRE} + d \cdot \text{RATE}$$

Where: WELF = Welfare Caseloads;
 b, c, & d = Coefficient values;
 CONSTANT = Constant term;
 PARTS = ET participants;
 EMPLOY = Total nonagricultural employment;
 FIRE = Finance, Insurance and Real Estate employment;
 RATE = Unemployment Rate (percent);
 SERV = Service sector employment;
 and, TRADE = Wholesale and retail trade employment.

This is not an exhaustive list of the equations that we estimated. Several variations on these forms were tried. In all cases FIRE, SERV and TRADE were substituted back and forth and included together. In addition to the variables listed above, alternative specifications were included with ET registrations and ET placements as substituted for PARTS. We also tried including applications received as an explanatory variable that would capture upward pressures on the caseload.

Data Sources and Definitions

All of the data on ET participation, registration and placements came from the DPWS RP&E unit. Registrations were reported to us as new registrations in one month. Participants are the number of people actively participating in one of the several work and training components of ET in a given month, not just the number of people entering an active component that month. Placements are the number of job placements made that month. The observations on the welfare caseload are from internal welfare memos and were checked by DPW's Budget Office.

We chose Massachusetts employment level as a measure of the strength of the economy. Employment was chosen because the data is readily available on a monthly basis and corresponds with the frequency of the other data. We were thus able to minimize the possibility of overmassaging the data. Employment is highly correlated to incomes and output. Better measures of economic activity are likely to be hours worked, incomes, or outputs, but employment is reported on a monthly basis in a reliable form with a much shorter reporting lag than the other measures.

RATE is the Massachusetts' seasonally unadjusted unemployment rate as a percent. Similar equations were tried with UNEMP, the number of unemployed. This term was added in an attempt to capture the differences caused by changes in general employment levels, e. g., employment hasn't grown much but the relative pool of unemployed has shrunk. In the end, we dropped these terms because they were found to be insignificant in all of the equations and in both forms. The coefficients exhibited the expected sign, but including RATE or UNEMP only clouded the effects of the other variables. Part of the reason that they were insignificant has to do with the fact that during the period of ET the unemployment rate in Massachusetts has been the lowest of all the industrial states and, more importantly, has not varied much. The impact of unemployment or the unemployment rate may be more measurable for other time periods when it was more volatile.

Underlying the change in the level of AFDC caseloads were eligibility and benefit changes that occurred during the study period. It is important to incorporate these into the statistical model so that their impact is not incorrectly attributed to other variables. We compiled a list of all the eligibility and benefit changes that took place since 1981 with the help of

the DPW's Budget Office (see Table 1, page 6). We also spent some time with one of their analysts to get a sense of the relative impact these changes had on the caseload, and the timing of these impacts. Through this process and with some further statistical analysis, we identified an eligibility change with a major effect on the caseload that it was necessary to explicitly build into the model. This was the extension of eligibility to pregnant women in their first and second trimesters which was incorporated in the model by adding dummy variables.

Evaluation Process

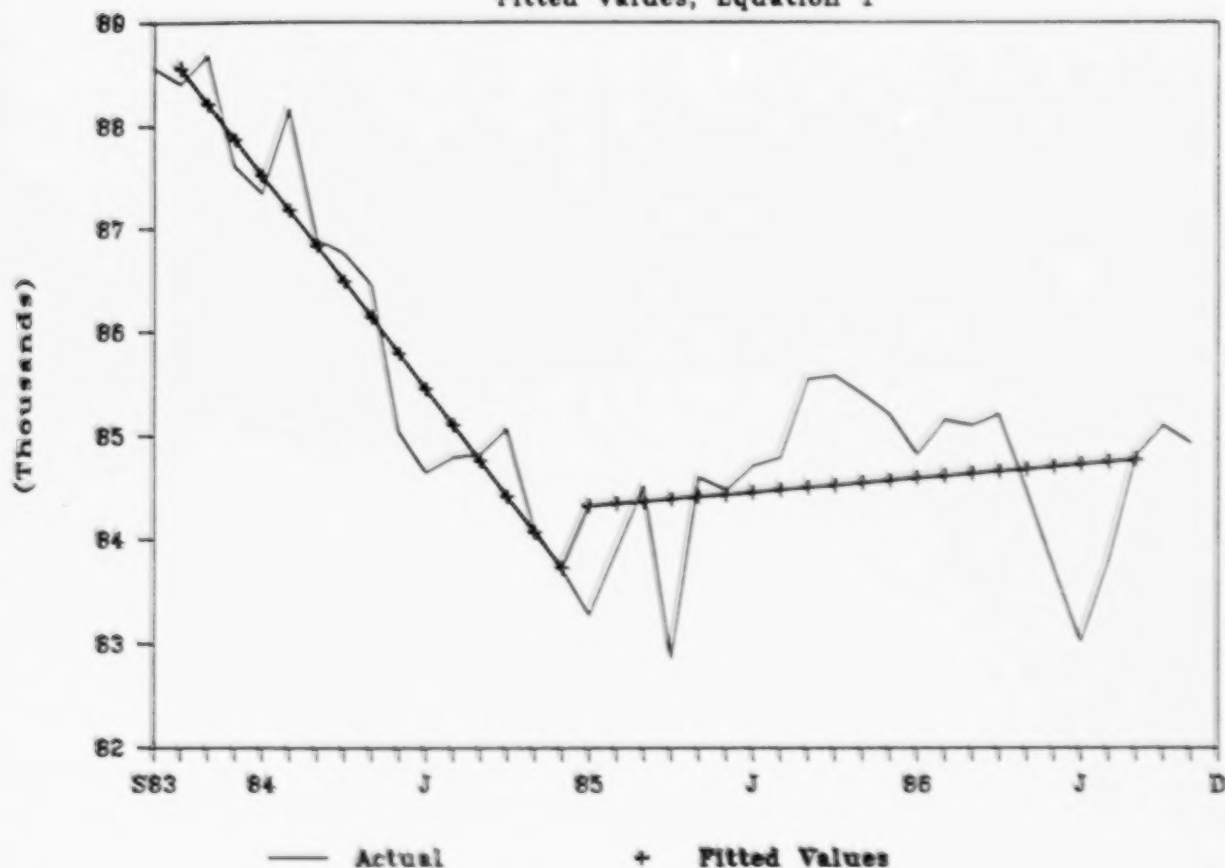
In evaluating the results of the regressions that were run, four steps were taken. First, the signs of the regression coefficients were examined. The sign indicates the direction that the dependent variable moves when an explanatory variable changes. We expect the signs of the coefficients for employment and ET participation to be negative: we expect the caseload to go down when these activities are increased. If the signs are in the correct direction, the regression results warrant further scrutiny.

The next step is to evaluate the t-statistic associated with a variable. If the t-statistic is small then we are not very confident that the reported coefficient is correct and would not continue to the next stage of the evaluation. Generally speaking, the number of cases and variables used in the equations we ran yielded 30 or more degrees of freedom. The critical value for a two-tailed test at the 90 percent confidence level is 1.697. The t-critical value for an 80 percent confidence level is 1.310. Often, if only one of several variables had a t-statistic that was too low, the equation is reestimated without the questionable variable.

The third step is to examine the size of the effects attributed to the separate variables. Special care was taken to examine the units that the variables are measured in. The effects of variables measured in different units are compared by examining the standard, or beta, coefficients. The standard coefficient indicates the impact that the movement of an explanatory variable has on the explained variable, and is measured by how many standard deviations the explained variable is changed when the explanatory variable moves by one standard deviation. Standard deviations are measured in the same units as the original variable. The standard coefficients facilitate comparison of the effects of two variables of different scales because the effects are normalized to comparable scales. (For a further discussion of standard coefficients, see Pindyck & Rubinfeld, *ECONOMETRIC MODELS & ECONOMIC FORECASTS*, pp. 90-91).

These first three steps were performed for each individual explanatory variable in every equation. If an equation passed the above tests, we went on to consider the overall fit of the equation. To put this another way, we want to know how much of the variation in the dependent variable, welfare caseloads, is explained by the independent variables. The most commonly used statistical measure of this is the adjusted R-squared (Adjusted Squared Multiple R in the tables below). This measure is the ratio of the explained variation in the dependent variable to its total variation adjusted for the number of degrees of freedom (statistical adjustments for the number of observations and the number of explanatory variables). The resulting equations are shown below and discussed in turn.

FIGURE 1A
Fitted Values, Equation 1



Equation 1

Dep Var: WELF N: 38 Multiple R: .900 Squared Multiple R: .810
Adjusted Squared Multiple R: .794 Standard Error of Estimate: 682.486

Variable	Coefficient	Std Error	Std Coef	Tolerance	T
CONSTANT	89252.700	357.899	0.000	1.0000000	249.380
PERIOD	-345.200	37.613	-2.616	.0688259	-8.326
PREG	-5306.305	713.575	-1.758	.0969448	-7.439
PREG* PERIOD	367.725	42.781	3.636	.0302622	8.595

Analysis of Variance

Source	Sum-of-squares	DF	Mean-square	F-Ratio	P
Regression	.697092E+08	3	.232364E+08	49.886	0.000
Residual	.163025E+08	35	465786.789		

Durbin-Watson d Statistic 1.066
First Order Autocorrelation .463

Equation 1 treats the welfare caseload as a trend variable that depends on time and the single largest policy change that occurred during the life of ET. This equation performs quite well on all of the criteria outlined above. All t-statistics are significant at the 99 percent confidence level. All of the signs and magnitudes of the coefficients are as we would expect. Finally the equation explains 79.4 percent of the total variation in the dependent variable, welfare caseloads.

This first equation fits the data very well, but it is not a test of the hypothesis that we are proposing. Equation 1 states that the welfare caseload is a function of time, of the policy change to extend benefits to pregnant women in their first and second trimesters, and the interaction between time and the policy change. Certainly the caseload changes over time, but it is more likely that a variable other than time explains the variation in the caseload. The reason we included this equation is to test the specification of the PREG and PREG*PERIOD variables for inclusion in other equations. PREG is a dummy variable set to zero for each month before benefits were extended and set to one when the policy was in force. PERIOD is simply the case number starting with one in October 1983.

Figure 1A plots the welfare caseload on a monthly basis from October 1983, the ET starting date, to November 1986, the latest date for which we had available data. It is easy to see the nearly linear downward trend in caseloads from October 1983 until January 1985, the time at which the change in eligibility took place. From then, the caseload begins to climb at a slightly higher rate than its earlier decline. Because the equation really describes two nearly linear relationships it is not surprising that the coefficients are significant and that the fit is extremely good.

In addition to the above equation we also ran several equations to test the significance of additional variables thought to have an upward pressure on caseloads. This step was performed after a member of the welfare department raised the point that all our included variables were capturing downward pressures on the caseload. The first of these we performed was for AFDC applications received (RECVD). Equation 2 is identical to Equation 1 except for the addition of the variable RECVD.

Equation 2

Dep Var:	WELF	N:	38	Multiple R:	.903	Squared Multiple R:	.820
Adjusted Squared Multiple R:	.798	Standard Error of Estimate:	684.835				
Variable	Coefficient	Std Error	Std Coef	Tolerance	T		
CONSTANT	90541.970	1044.703	0.000	1.00000000	86.668		
PERIOD	-541.869	37.227	-2.494	.0740615	-8.183		
PREG	-5174.271	745.954	-1.699	.0909888	-6.936		
PREG*							
PERIOD	365.976	43.693	3.508	.0311333	8.376		
RECVD	-0.339	0.258	-0.110	.7766185	-1.314		

ANALYSIS OF VARIANCE

Source	Sum-of-squares	DF	Mean-square	F-Ratio	P
Regression	.704066E+08	4	.176017E+08	37.330	0.000
Residual	.154770E+08	33	468998.806		
Durbin-Watson D Statistic	1.067				
First Order Autocorrelation	.452				

Evaluating Equation 2, we find that this equation fails the first test. The sign of the coefficient on RECVD is in the wrong direction. We had expected applications received to try and capture the effect of upward pressures on the caseload. Instead it showed the opposite effect. When we proceed to look at the t-statistic, we find, too, that the coefficient is not very significant. In an attempt to explain the wrong sign on the coefficient, we performed a correlation analysis of all the variables and found RECVD to be positively correlated with EMPLOY which has a significant downward pressure on the caseload. RECVD was picking up the effect of the more significant explanatory variable that was not included in the equation. Since RECVD was not significant and was only intended as a proxy for other upward pressures on the caseload, it was discarded from the model.

Having once decided that the form in which the policy change to include pregnant women in their first two trimesters was a correct approximation we included it in other equations of a more explanatory nature. We set out to test the hypothesis that the soaring economy and the booming labor market were responsible for the decline of the welfare caseload instead of the ET program. The next several equations are the real tests of our null hypothesis.

The first equation that tests this hypothesis is Equation 3. Included as explanatory variables for the caseload are ET monthly participation levels lagged three months (PRTL3), the number of employed persons (EMPLOY), the unemployment rate (RATE), PREG and PREG*PERIOD to capture the significant policy change, and a constant.

Equation 3

Dep Var: WELF N: 33 Multiple R: .805 Squared Multiple R: .649
Adjusted Squared Multiple R: .584 Standard Error of Estimate: 759.791

Variable	Coefficient	Std Error	Std Coef	Tolerance	T
CONSTANT	103376.146	18660.271	0.000	1.0000000	5.540
PRTL3	-1.089	0.303	-0.489	.7016581	-3.589
EMPLOY	-0.006	0.006	-0.360	.1113999	-1.053
RATE	473.817	356.220	0.340	.1986579	1.330
PREG	-9025.480	969.376	-1.255	.0804483	-3.121
PREG*					
PERIOD	114.320	41.365	1.366	.0532408	2.764

Analysis of Variance

Source	Sum-of-squares	DF	Mean-square	F-Ratio	P
Regression	.287789E+08	5	5755784.461	9.970	0.000
Residual	.155866E+08	27	577282.292		
Durbin-Watson D Statistic		1.452			
First Order Autocorrelation		.277			

Evaluating Equation 3 according to the above steps, we find that the direction of all the coefficients are as we would expect. However, we encounter more difficulty when moving to the next level as the t-statistic for EMPLOY is too low and the t-value for RATE is also close to the borderline. Proceeding as outlined, we dropped the EMPLOY term and reran the equation. The results were less than anticipated, so we tried again by adding EMPLOY back into the equation and dropping the RATE term. The results are shown in the statistics for Equation 4.

Equation 4 (Figure 2A next page)

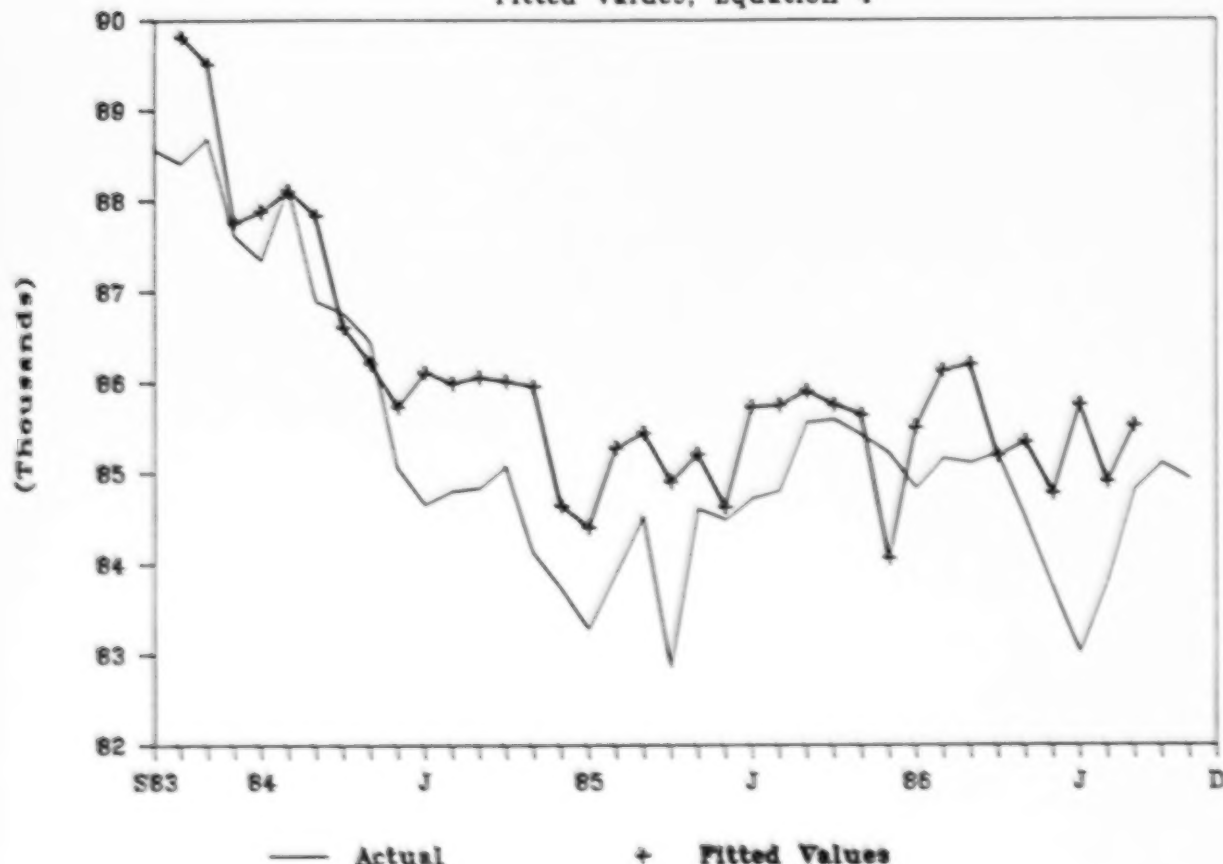
Dep Var: WELF N: 33 Multiple R: .791 Squared Multiple R: .626
Adjusted Squared Multiple R: .572 Standard Error of Estimate: 770.157

Variable	Coefficient	Std Error	Std Coef	Tolerance	T
CONSTANT	123358.659	8782.877	0.000	1.0000000	14.273
PRTL3	-1.074	0.307	-0.482	.7026096	-3.495
EMPLOY	-0.013	0.003	-0.753	.4408526	-4.324
PREG	-3544.190	889.384	-1.470	.0956818	-3.940
PREG*					
PERIOD	142.303	36.102	1.701	.0718172	3.942

Analysis of Variance

Source	Sum-of-squares	DF	Mean-square	F-Ratio	P
Regression	.277576E+08	4	6939393.066	11.696	0.000
Residual	.166000E+08	28	593141.850		
Durbin-Watson D Statistic		1.452			
First Order Autocorrelation		.277			

FIGURE 2A
Fitted Values, Equation 4



This equation passes all of our statistical evaluations: the directions of all the coefficients are what we expect to see; the t-statistics are all significant; the size of effect for all of the variables is reasonable; and, the overall fit of the equation is good.

The specification of the equation with the PRTL3 term, participation in a component of ET lagged three months, was developed after several regression tests. We tried all of the ET participation and placement variables in their original form, that is, as monthly observations without any lag. The statistics on those equations were not very good. They fit poorly and the coefficients were often of the wrong size and/or magnitude.

The equations where registrations were used as the measure of ET program activity were the least significant. This makes sense when one takes a closer look at how the program operates. AFDC clients or applicants register for the program but may not participate for months, or ever. So it is no surprise that registrations have no significant measurable impact on the caseload.

Placements tend to fluctuate up and down as training programs end in jobs for participants. The lumpiness of placements made it difficult to statistically isolate the steady contribution of ET.

Participations are the most likely indicator of program activity, but participations are not likely to have an immediate impact on the caseload since program activity is likely to last several months before a case closing results. To solve this timing problem, we tried lagging placements and

participations various lengths of time (1-4 months). The equations with participations lagged three months yielded the best-fitting equations and the most significant statistics.

Having decided on the specification in Equation 4, how do we interpret the resulting statistics? The CONSTANT, PREG, and PREG*PERIOD coefficients are all of the proper magnitude and direction. Their t-statistics are all significant. The coefficients for PRTL3 and EMPLOY are also statistically significant. The coefficient on PRTL3 tells us that for every participation in ET, the caseload declines by one after three months. The EMPLOY coefficient tells us that for every 1,000 new jobs that are added, the caseload will decline by 13 cases.

Employment and the ET program both cause the welfare caseload level to go down. This forces us to reject our null hypothesis that the Massachusetts economy is solely responsible for the decline in the welfare caseloads. For us to accept our null hypothesis the coefficient on PRTL3 would have to be close to zero and the coefficient on EMPLOY would have to be significantly less than zero. It also forces us to reject the alternative hypothesis that ET alone is responsible for this decline. This requires that the PRTL3 coefficient be less than zero and the coefficient for EMPLOY be close to zero. An acceptable alternative does present itself: Equation 4 shows that the strong labor market and the ET program both caused the welfare caseload to go down.

Equation 4 cannot tell us what would have happened to the welfare caseload in the absence of either a strong labor market or ET, but it does allow us to make some comparisons of their relative effects. The coefficients show us a nearly one-to-one participation impact and a 13-to-1,000 employment impact on the caseload. Comparing the effects of program participation and employment levels is a little like comparing apples and oranges. We are trying to compare the impact of a program with an average monthly participation level of 1,961 to the effect of an employed work force that is approaching three million.

The standard coefficients help us to make this comparison. The standard coefficient of PRTL3 is -0.482, that is, holding all else constant, if participations in a month increase by one standard deviation (599 participants) from its mean, then the caseload would go down by 0.482 standard deviations (725 cases) three months later. On the other hand, caseloads would decline by 0.753 standard deviations (1,133 cases) if employment were to increase by one standard deviation (83,819 jobs) from its mean. To put it another way, the caseload declines 1.56 times more for an increase of one standard deviation in employment as for an equivalent movement in program participation.

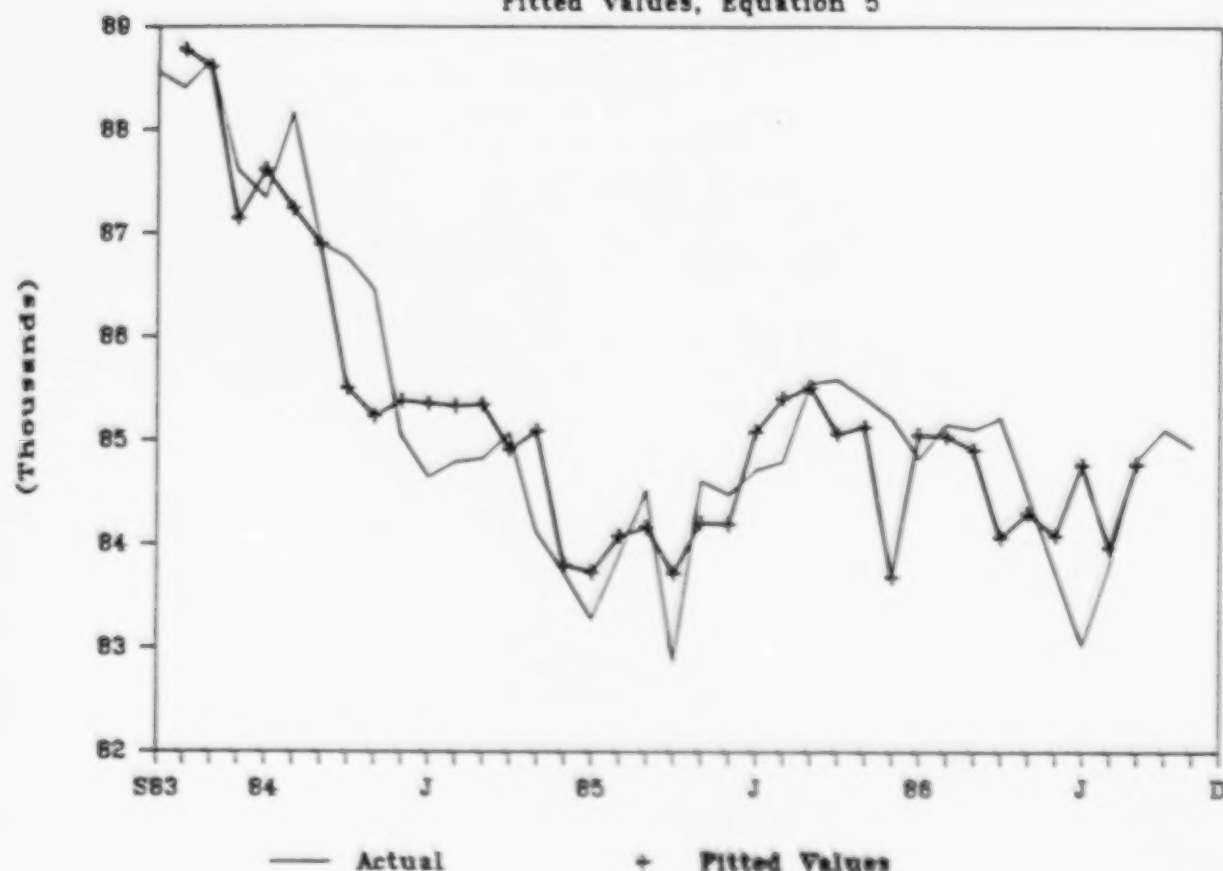
From a policy perspective, the standard coefficients indicate that, if all of the variables are at their average, it would take the creation of 7,575 new jobs to reduce the AFDC caseload by 100 cases. It would require an increase of 82 ET participations to obtain the same reduction in the caseload. These figures should be used in a relative, not absolute, sense. Standardized coefficients are only meaningful in a very limited context.

Differences in Industrial Employment

The economic structure of Massachusetts is much different today than it was in the mid-1970s. The manufacturing sector accounted for over a quarter of total employment in 1975 and 1978. Today it accounts for only one-fifth of Bay State employment. The five percentage points that manufacturing employment has lost have been picked up by the service sector. Services provided 22 percent of all jobs in 1978, over 27 percent today. Sizeable gains have taken place in trade, construction, and finance, insurance and real estate (FIRE).

Some critics suggest that AFDC recipients are better suited to employment in these industrial sectors without the large investment in ET. On the other hand, our statistical analysis shows that the ET program did have a significant effect on the caseload even when economic activity was included as a variable. We reran the equations with the employment variable limited to the trade, service and FIRE sectors to try and shed some light on this issue. Equations 5, 6 and 7 below contain these results.

FIGURE 3A
Fitted Values, Equation 5



Equation 5

Dep Var: WELF N: 33 Multiple R: .810 Squared Multiple R: .656
Adjusted Squared Multiple R: .607 Standard Error of Estimate: 738.024

Variable	Coefficient	Std Error	Std Coef	Tolerance	T
CONSTANT	123619.570	7583.511	0.000	1.0000000	16.301
PRTL3	-1.105	0.295	-0.496	.7017288	-3.750
SERV	-0.048	0.010	-1.101	.2315662	-4.780
PREG	-4590.308	922.587	-1.904	.0637991	-4.975
PREG*					
PERIOD	208.506	41.992	2.492	.0487459	4.965

Analysis of Variance

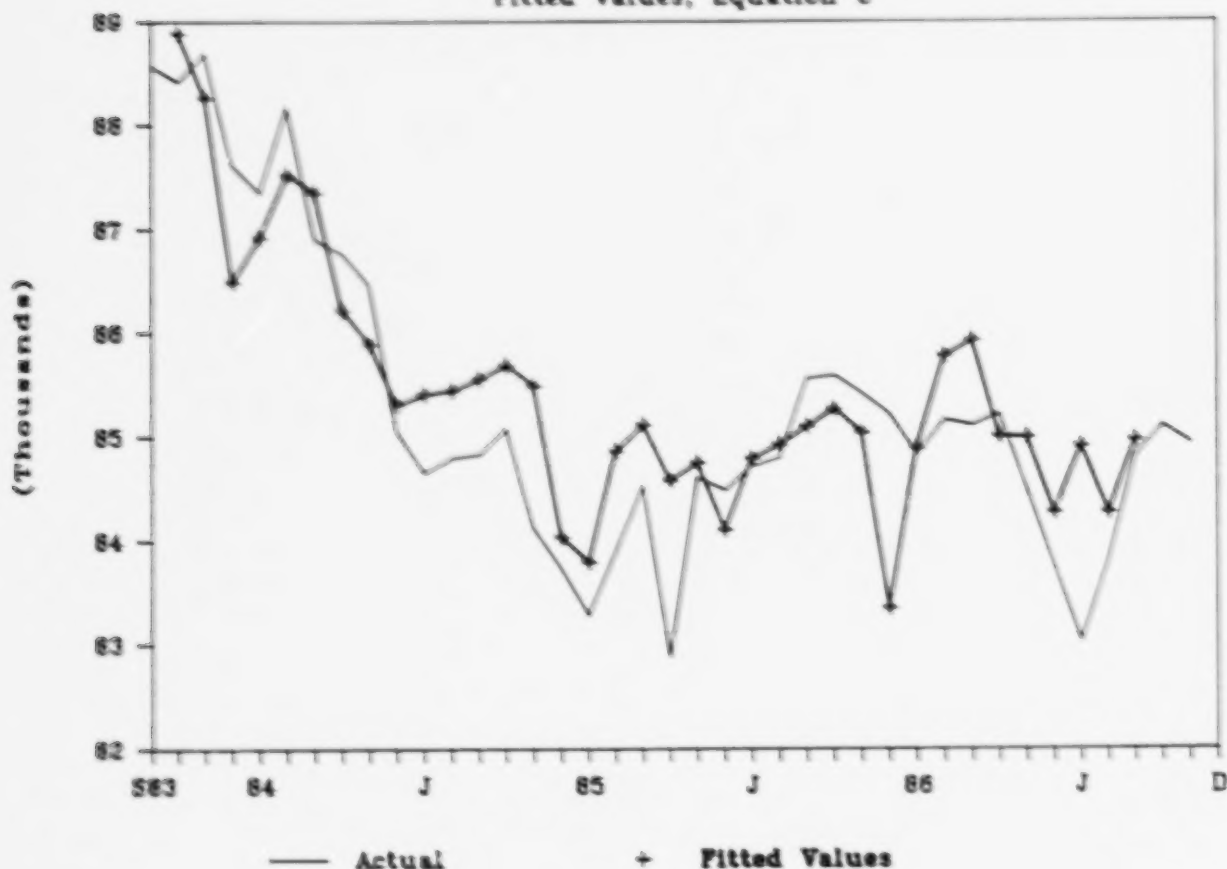
Source	Sum-of-squares	DF	Mean-square	F-Ratio	P
Regression	.291145E+08	4	7278630.488	13.363	0.000
Residual	.152510E+08	28	544679.365		
Durbin-Watson D Statistic		1.702			
First Order Autocorrelation		.163			

The service sector is discussed first since it is the largest of the three sectors, accounting for 27.35 percent of total employment at the end of 1986. Service sector employment during the period of our study grew by 17.2 percent compared to 12.7 percent growth in total employment. The coefficient for SERV, service sector employment is almost four times as great as the EMPLOY coefficient in Equation 4. The standard coefficient is also greater, -1.101 versus -0.753. The coefficient is larger probably because the values for SERV are much smaller than the values for EMPLOY. They are describing the same basic relationship, but the coefficient has to be larger to account for the same effect.

The order of magnitude of the standard coefficients of SERV, PRTL3, and EMPLOY is what is truly different in this equation. The ratio of standard coefficients in Equation 4 was 1.36, in Equation 5 the ratio is 2.21. The equation overstates the importance of the service sector because it is the only employment sector included in the equation, but still indicates that the growth of service sector jobs has been of more importance than the growth of total employment in explaining the change in the welfare caseload. Equation 5 does not indicate that the administration should shift its efforts toward job creation. The results indicate that, at the average, 1,894 service sector jobs would have to be created to achieve 100 case closings, 80 additional ET participations would have the same effect.

FIGURE 4A

Fitted Values, Equation 6



Equation 6

Dep Var: Welf N: 33 Multiple R: .784 Squared Multiple R: .615
Adjusted Squared Multiple R: .560 Standard Error of Estimate: 780.955

Variable	Coefficient	Std Error	Std Coef	Tolerance	T
CONSTANT	111151.337	5706.103	0.000	1.0000000	19.478
PRTL3	-0.936	0.313	-0.420	.6876831	-2.993
TRADE	-0.036	0.009	-0.770	.4036166	-4.173
PREG	-4000.818	838.667	-1.660	.0906443	-4.262
PREG*					
PERIOD	155.937	38.346	1.864	.0654484	4.066

Analysis of Variance

Source	Sum-of-squares	DF	Mean-square	F-Ratio	P
Regression	.272886E+08	4	6822154.964	11.186	0.000
Residual	.170769E+08	28	609890.154		

Durbin-Watson D Statistic 1.283
First Order Autocorrelation .359

The trade sector is the next largest of the three sectors given additional consideration, accounting for 23.8 percent of Massachusetts total employment in 1986. Growth in trade employment from 1983 to 1986 was even more dramatic at 18.8 percent. The absolute size of the coefficients for TRADE and PRTL3 are both lower in Equation 6 than the SERV and PRTL3 coefficients in Equation 5. We had expected to see the TRADE coefficient to be larger since this sector is smaller than the service sector if the equation is describing the same effect.

Comparison of the standard coefficients shows a corresponding decrease in the effect of the trade sector relative to ET participation. The ratio of the TRADE to the PRTL3 standard coefficient is 1.83; employment in the trade sector has 83 percent greater impact on the caseload than for program participation when expressed as a standard deviation movement from their means. This also means that employment and program participation levels both need to be increased relatively more to achieve 100 case closings. According to the statistics in Equation 6, employment in wholesale and retail trade would have to increase by 2,492 from the mean, and program participation levels by 94, as compared to 1,894 service sector jobs and 80 participations as in Equation 5.

Equation 7 (Figure 5A next page)

Dep Var: WELF N: 33 Multiple R: .788 Squared Multiple R: .621
Adjusted Squared Multiple R: .566 Standard Error of Estimate: 775.415

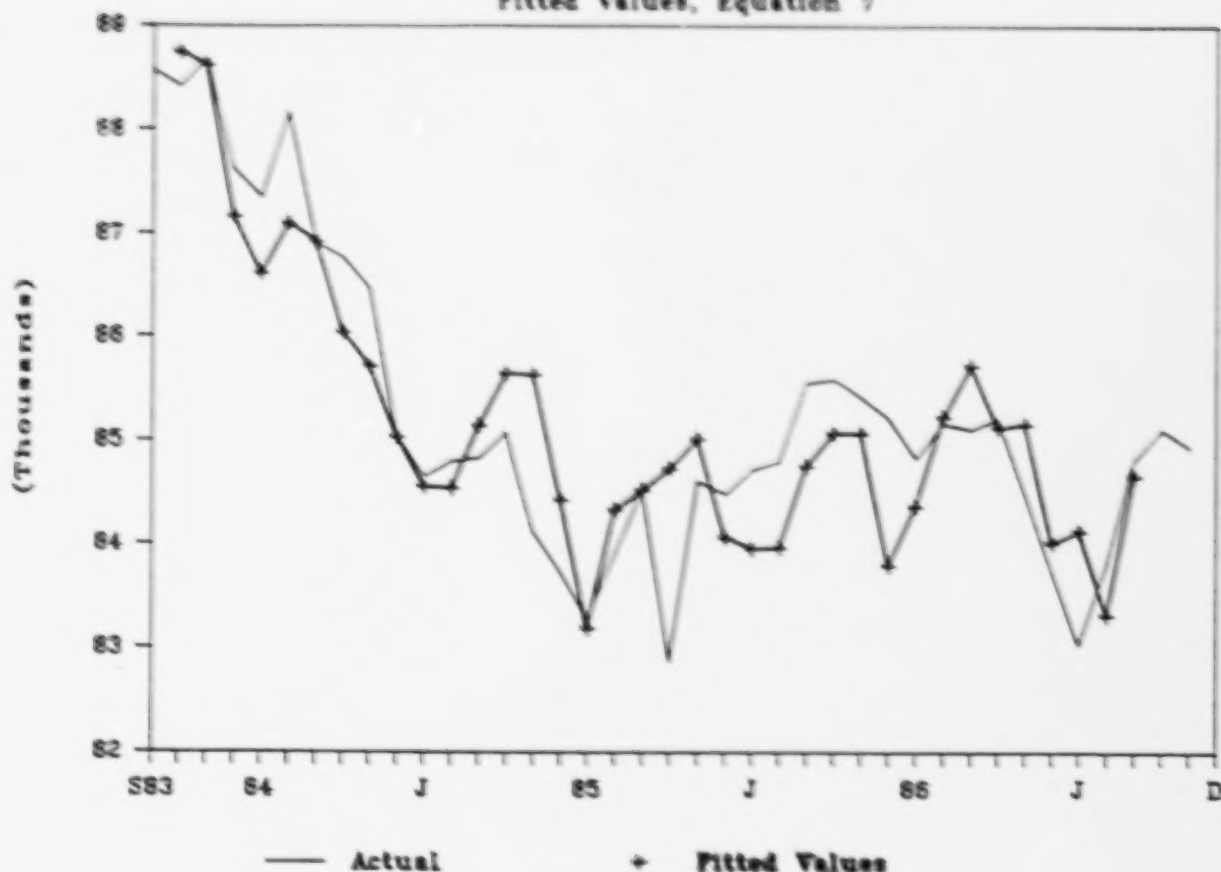
Variable	Coefficient	Std Error	Std Coef	Tolerance	T
CONSTANT	122320.849	8221.461	0.000	1.0000000	14.878
PRTL3	-0.945	0.310	-0.424	.6895386	-3.044
FIRE	-0.196	0.046	-1.373	.0988779	-4.250
PREG	-5488.748	1085.137	-2.277	.0668672	-5.058
PREG*					
PERIOD	277.729	58.116	3.319	.0290929	4.779

Analysis of Variance

Source	Sum-of-squares	DF	Mean-square	F-Ratio	P
Regression	.275300E+08	4	6882504.119	11.447	0.000
Residual	.168355E+08	28	601268.847		

Durbin-Watson D Statistic 1.170
First Order Autocorrelation .415

FIGURE 5A
Fitted Values, Equation 7



Employment in the FIRE firms accounted for almost seven percent of total state employment in 1986. Employment growth in this sector from 1983 to 1986 was 19.1 percent, second only to construction employment. As expected, the raw coefficient for FIRE is much larger than for any other of the employment variables we examined because a smaller sector is trying to explain a larger effect. The results in Equation 7 show that FIRE employment has one-fifth the power of program participation in reducing the AFDC caseload. Comparison of the standard coefficients shows a standard deviation movement from the mean in FIRE sector to cause 3.7 times the impact on caseloads as an equivalent increase in PRTLJ. The standard coefficients suggest that the addition of 442 new jobs in finance, insurance and real estate will reduce the AFDC caseload by 100 cases; 93 additional participations will yield 100 case closings.